

Borehole

30-00-06**Log Event A****Borehole Information**

Farm : <u>C</u>	Tank : <u>C</u>	Site Number : <u>299-E27-55</u>
N-Coord : <u>42,677</u>	W-Coord : <u>48,370</u>	TOC Elevation : <u>652.57</u>
Water Level, ft :	Date Drilled : <u>12/31/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.313</u>	ID, in. : <u>8</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>154</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.500</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>7</u>	Bottom Depth, ft. : <u>58</u>	

Cement Bottom, ft. : 155 Cement Top, ft. : 154

Borehole Notes:

This borehole was drilled in December 1944 and completed to a depth of about 154 ft with 8-in. casing. A string of 12-in. surface casing is also present and assumed to extend from just below the ground surface to a depth of about 54 ft. The top of the 12-in. casing is not visible at the ground surface, but the driller's log notes its presence. The space between the outer 12-in. and inner 8-in. casing may be grouted, although the driller's log contains no mention of grout in this interval. The driller's log indicates that the borehole was perforated from 53 to 154 ft with five perforations per foot and that the bottom 8 in. of the borehole was grouted with half a bag of cement.

The zero reference for the SGLS logs is the top of the 8-in. casing. This borehole is located in the side of a hill and the top of the 8-in. casing is approximately 7 ft above the tank farm ground surface. The current depth of the borehole, as verified with an electrical tape, is 111 ft. There is no information given as to when or how the bottom portion of the borehole was filled.

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1996</u>	Calibration Reference : <u>GJO-HAN-13</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>03/25/1997</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>111.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>70.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Log Run Number :	<u>2</u>	Log Run Date :	<u>03/26/1997</u>	Logging Engineer:	<u>Bob Spatz</u>
Start Depth, ft.:	<u>71.0</u>	Counting Time, sec.:	<u>100</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>0.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Analysis Information

Analyst : D.L. ParkerData Processing Reference : P-GJPO-1787Analysis Date : 06/27/1997**Analysis Notes :**

This borehole was logged by the SGLS in two log runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS was operating within specifications. The energy calibration and peak-shape calibration from these spectra were used to establish peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation. There was some gain drift during logging operations and it was necessary to adjust the established channel-to-energy parameters during processing of log data to maintain proper peak identification.

This borehole is double-cased from an unknown depth near the ground surface to about 58 ft. An appropriate casing correction factor for the double-cased portion of the borehole is not available. An appropriate correction factor would have to account for approximately 0.5-in.-thick steel casing (12-in.-diameter casing), an approximately 3-in.-thick section of air or possibly grout, and a 0.322-in.-thick second steel casing (8-in.-diameter casing). Data from above 58 ft could not be completely analyzed because of the attenuation caused by the double-steel casings in this interval, and the potential for grout between the two casings.

A casing correction factor for a 0.330-in.-thick casing was applied during the analysis of borehole data. This correction factor most closely matches the actual casing thickness (0.322-in.) below a depth of 58 ft. Use of this casing correction factor will cause the concentrations of radionuclides to be slightly overestimated below 58 ft.

The man-made radionuclides detected in this borehole are Cs-137 and Co-60. The presence of Cs-137 was measured almost continuously from the ground surface to a depth of 5 ft and intermittently from 57 ft to the bottom of the logged interval. Co-60 contamination was detected only at 77.5 ft.

The logs of the naturally occurring radionuclides show a decrease in K-40 concentrations at approximately 7 ft, and an increase at 58 ft. K-40 concentrations increase gradually from about 60 to 97 ft.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank C-101.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a



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radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A plot of representative historical gross gamma-ray logs from 1975 to 1992 is included. The headings of the plots identify the date on which the data in the plots were gathered.